

REMARKS

Reconsideration of this application, as presently amended, is respectfully requested. Claims 1-33 are pending in the present application. Claims 1-4, 12, 13, 28 and 29 are rejected. Claims 5-11, 14-27 and 30-33 have been withdrawn. Applicants have made minor changes to the form of claims 1 and 2 to place them in better condition for consideration. The rejection set forth in the Office Action is respectfully traversed below.

I. THE PRIOR ART REJECTION

Claims 1-4, 12, 13, 28 and 29 are rejected under 35 U.S.C. §102(b) as being anticipated by Tan et al. (USP 6,001,706).

Tan is cited in the Action for the disclosure of a fabrication system including polishing slurry/CMP step. Three secondary references (Koutny, Hsu and Wang) are cited for the disclosure CMP is characterized “by polishing a wafer surface with an abrasive cloth (pad) while supplying a polishing solution (slurry) mixed with abrasive grains.” The Examiner concludes that Tan, by disclosing CMP so defined, would anticipate the pending claims.

II. APPLICANTS' RESPONSE

Applicants respectfully traverse the rejection because Tan fails to disclose “polishing the surface of the film-to-be-polished with the polishing pad while the polishing slurry and water (or a mixture of the polishing slurry and water) are being supplied onto the polishing pad.”

In the presently claimed invention, a film is polished by using a polishing slurry containing abrasive grains and a surfactant additive. The reason that a polishing slurry containing abrasive grains and a surfactant additive is used in the present invention is that the polishing rate of such polishing slurry is high and such polishing slurry provides good planarity. Though Tan mentions CMP (e.g., the Abstract), it neither discloses nor suggests a polishing slurry containing abrasive grains and a surfactant additive.

Additionally, in the present invention, the film is polished with a polishing pad *while the polishing slurry and water* (or a mixture of *polishing slurry and water*) are being supplied onto the polishing pad after the surface of the film has been planarized. That is to say, a finish-polish is performed *while a polishing slurry and water* (or mixture of a *polishing slurry and water*) are being supplied onto the polishing pad after a main-polish is performed.

If the finish-polish is performed while water *only* is being supplied onto the polishing pad, the concentration of the abrasive grains is decreased gradually, and the polishing rate decreases gradually (see Fig. 5 of the present application), in nearly parallel curves. Therefore, the film-to-be-polished cannot be polished under stable conditions when the finish-polish is performed while water *only* is being supplied onto the polishing pad. Accordingly, the depth of dishing formed in the surface of the film-to-be-polished varies widely.

In the presently claimed invention, since the surface of the film-to-be-polished is polished with *both the polishing slurry and water* (or a *mixture of the polishing slurry and water*) being supplied onto the polishing pad, whereby the concentration of the abrasive grains, the concentration of the additive and the polishing rate can be retained substantially constant (see

Fig. 6 of the present application), again in nearly parallel lines. Therefore, the present invention permits the film to be polished under stable conditions. Accordingly, in the present invention, the dispersion of the depth of the dishings is decreased, and intra-plane dispersion of the film is small.

Tan neither discloses nor suggests such feature of the present invention.

Koutny, Jr. (USP 6,171,180) discloses a polishing process by using an abrasive containing abrasive slurry particles (col. 1, line 60 through col. 2, line 17).

Hsu (USP 6,677,239) discloses a polishing process by using an abrasive sheet polishing media and compositions containing surfactant additives (col. 10, lines 18-24).

Wang (USP 6,046,112) discloses a polishing process using CMP slurry composition comprising ZrO₂ particles and a surfactant in a water solution (col. 6, lines 13-17).

Moreover, the disclosure of *particular* CMP compositions in those references is not a disclosure of what the CMP composition of Tan.

Applicants therefore submit that neither Tan, nor the combination of references, would anticipate or render obvious the method of the present claims.

CONCLUSION

In view of the foregoing amendments and accompanying remarks, Applicants submit that all pending claims are in condition for allowance. A prompt and favorable reconsideration of the rejection and an indication of allowability of all pending claims are earnestly solicited.

Application No. 10/823,729
Group Art Unit: 2818

Amendment under 37 C.F.R. §1.111
Attorney Docket No.: 042341

If the Examiner believes that there are issues remaining to be resolved in this application, the Examiner is invited to contact the undersigned attorney at the telephone number indicated below to arrange for an interview to expedite and complete prosecution of this case. If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,
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